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DERWENT-ACC-NO: 1974-30651V

DERWENT-WEEK: 197416

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TITLE: Water purificn. - using electrolysis
to release oxygen

PATENT-ASSIGNEE: MCMENAMIN S H[MMENI]

PRIORITY-DATA: 1971ZA-0007184 (October 12, 1971)

PATENT-FAMILY:

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INT-CL (IPC): C02B000/00

ABSTRACTED-PUB-NO: ZA 7107184A

BASIC-ABSTRACT:

Method of purifying water includes adding to water electrolyte sufficient to render it conductive and leading the water past a pair of electrodes to release oxygen at the cathode to injure micro-organisms in the water.

The electrolyte is e.g. NaCl added in amount ≥ 200 ppm and the potential across the electrodes is typically 12V. The electrodes are made of material not corroded by oxidation under the conditions of use e.g. a stainless steel mesh anode and a Pt cathode.

In purifying swimming pool water pipe (12) between filter and pool comprises stainless steel mesh anode (14) separated by plastic mesh (16) from a platinum mesh cathode. Potential of 12 volts is applied to electrodes to give 60 ma current with water containing 1 part NaCl to 5000 parts

water. Mesh disc
electrodes may be used. Sea water may be added to water.

TITLE-TERMS: WATER PURIFICATION ELECTROLYTIC RELEASE OXYGEN

DERWENT-CLASS: D15

CPI-CODES: D04-A02;

REPUBLIC OF SOUTH AFRICA

*The Patents Act 1952 as Amended*COMPLETE SPECIFICATION

Official Filing Date and Application No.

27.10.1971

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Title: "IMPROVEMENTS IN WATER PURIFIERS"

I/~~we~~ do hereby declare this invention, the manner in which
and the method by which it is to be performed, to be particularly
described and ascertained in and by the following statement :-



This invention relates to water purification in general, and has particular utility in the purification of swimming bath water, or aquaria water.

Present practices for purifying swimming pool water include the addition thereto of calcium or sodium hypochlorite or of gaseous chlorine.

The addition of powdered hypochlorite introduces a cleaning problem and is expensive. The treatment with chlorine gas involves sophisticated apparatus and also introduces a danger.

It is an object of the present invention to provide a method and apparatus for purifying water which is very simple, inexpensive and hazardless.

A method of purifying water according to the invention includes the steps of ensuring that the water has a sufficient ionic concentration for it to be conductive and leading the water past a pair of electrodes to which a suitable direct current is applied.

The conditions should be chosen so that the amount of nascent oxygen liberated at the anode is sufficient to destroy the micro-organisms in the water.

In an example of the invention, as applied to a 100.000 litre swimming pool, 2kg. - 20 kg. of sodium chloride are added and the pH maintained at about 6,8 - 7,4.

A unit including a stainless steel and a platinum electrode is located in the stream of circulating water, and in the case of a swimming pool, it is preferably located in the circuit after the filter and before the water is reintroduced into the pool.

A potential of 12 volts is applied to the electrodes to produce a current therebetween of between 50 and 150 milliamps. If the current drops below this value, further amounts of sodium chloride are added to increase the conductivity of the water. Alternatively, hydrochloric acid may be added, which is preferred because of the pH requirement.

It has been found that a weekly addition of 250 ml. of HCl is sufficient to keep the pH at the correct level. Theoretically, no further amounts of sodium chloride need be added but the hydrolysis may also involve the liberation of chlorine gas in small quantities (which further assists in purifying the water) with concomitant loss of chloride ions and raising of the pH.

It will be appreciated that the costs of maintaining a pool of sparkling water according to the present invention is very small indeed.

An embodiment of the invention is described below with reference to the accompanying drawings, in which:

Figure 1 is a side view of an apparatus according to the present invention, and

Figure 2 is a cross section along the line 2-2 of Figure 1.

In the drawings, a unit generally designated as 10 is housed in a pipe 12. The unit comprises a stainless steel mesh anode 14 separated by means of a plastic mesh 16 from a platinum mesh cathode. It has been found that a potential of 12 volts produces an amperage of 60 milliamps with a swimming pool water containing one part of NaCl per 5000 parts of water.

A simpler electrode system consisting of a disc of platinum mesh fitting across the pipe, as cathode, and a stainless steel mesh anode in close proximity, has also been found to be effective.

The advantage of locating the unit between the filter and the inlet to the pool is that it cannot be clogged with debris.

The potential can be obtained by connecting a simple 12 volt battery charger or the like to the source of mains current.

It will be appreciated that the arrangement of the present invention results in the formation of hydrogen at the anode and oxygen at the cathode, and it is believed that the purifying action is caused by the nascent oxygen which is first formed at the cathode.

For the treatment of drinking water, a similar arrangement may be provided and the small concentration of electrolyte necessary for conductivity for formation of nascent oxygen,

may be provided by the addition of sea water in a pre-determined amount. Approximately 1 part sea water to 350 parts of fresh water is suitable and the resulting water would provide necessary trace elements to drinking water.

Aquaria water, both fresh and saline, may be kept clear, using this simple arrangement, and the released oxygen can only have a beneficial effect on the fish.

HAVING NOW PARTICULARLY DESCRIBED AND ASCERTAINED OUR INVENTION AND IN WHAT MANNER IT IS TO BE PERFORMED, WE DECLARE THAT WHAT WE CLAIM IS:

1.

A method of purifying water including the steps of adding to the water an amount of electrolyte sufficient to render it conductive and leading the water past a pair of electrodes to which a direct current is provided to release a predetermined volume of oxygen at the cathode to injure micro-organisms in the water.

2.

The method of claim 1, in which sodium chloride is the electrolyte and is added to the extent of at least about 200 parts per million and the potential across the electrodes is about 12 volts.

3.

Apparatus for purifying water including an electrode system adapted to be located in a pipe conveying water having about 200 parts per million of electrolyte, the electrodes being non-corroded by oxidation under the conditions of use, and a source of direct current for the electrodes.

4.

The apparatus of claim 3 in which the anode is stainless steel mesh and the cathode is platinum.

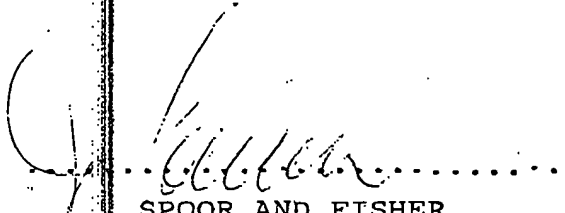
5.

A method for purifying water substantially as herein described with reference to the accompanying drawings.

6.

Apparatus for purifying water substantially as herein described with reference to the accompanying drawings.

DATED this 17th day of October, 1972.


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FORMAL DRAWINGS

ORIGINAL

Fig. 1

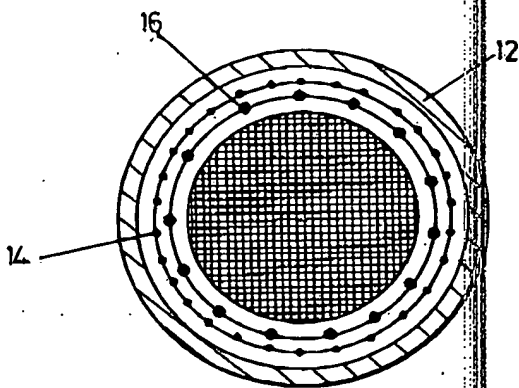
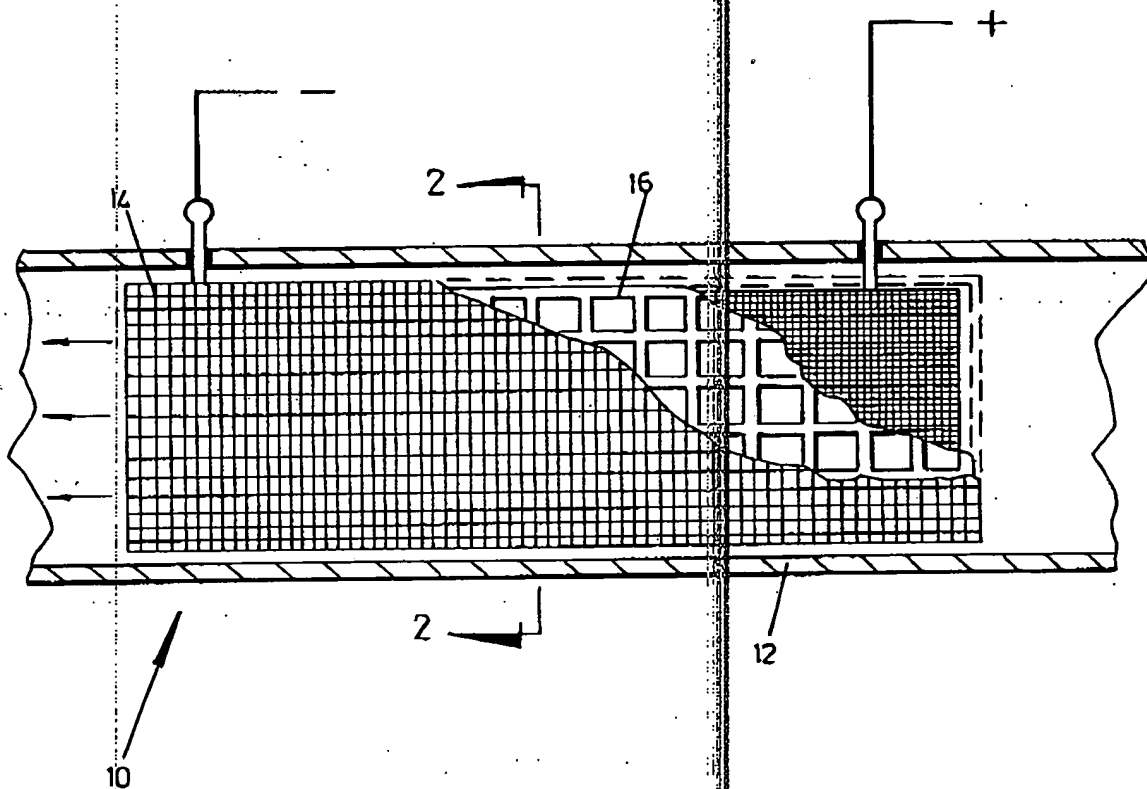


Fig. 2

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